

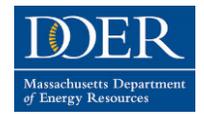
# State Energy Storage Policy Vermont: The Path Forward

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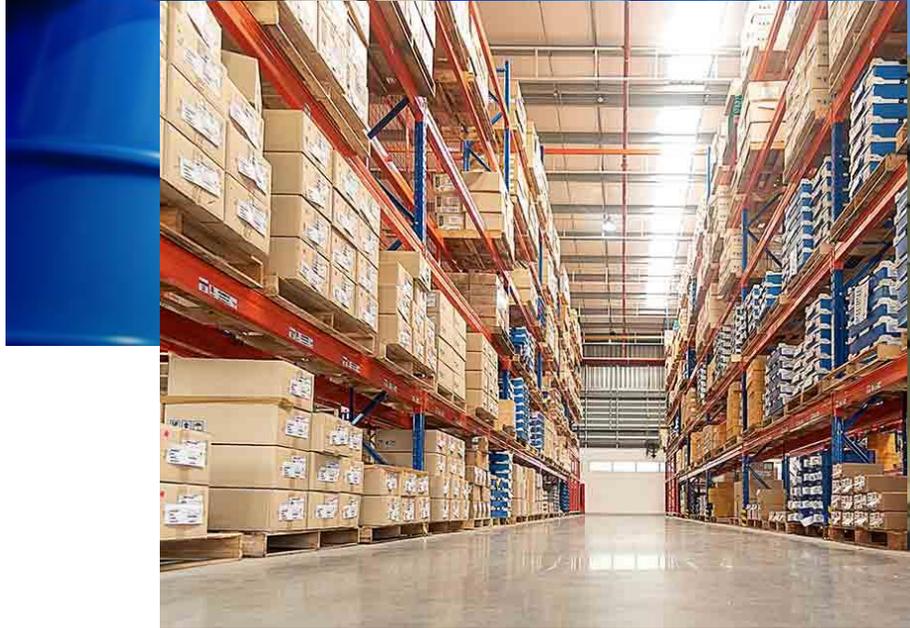
Vermont Senate Natural Resources and Energy Committee  
March 29, 2023

# About CEG and CESA

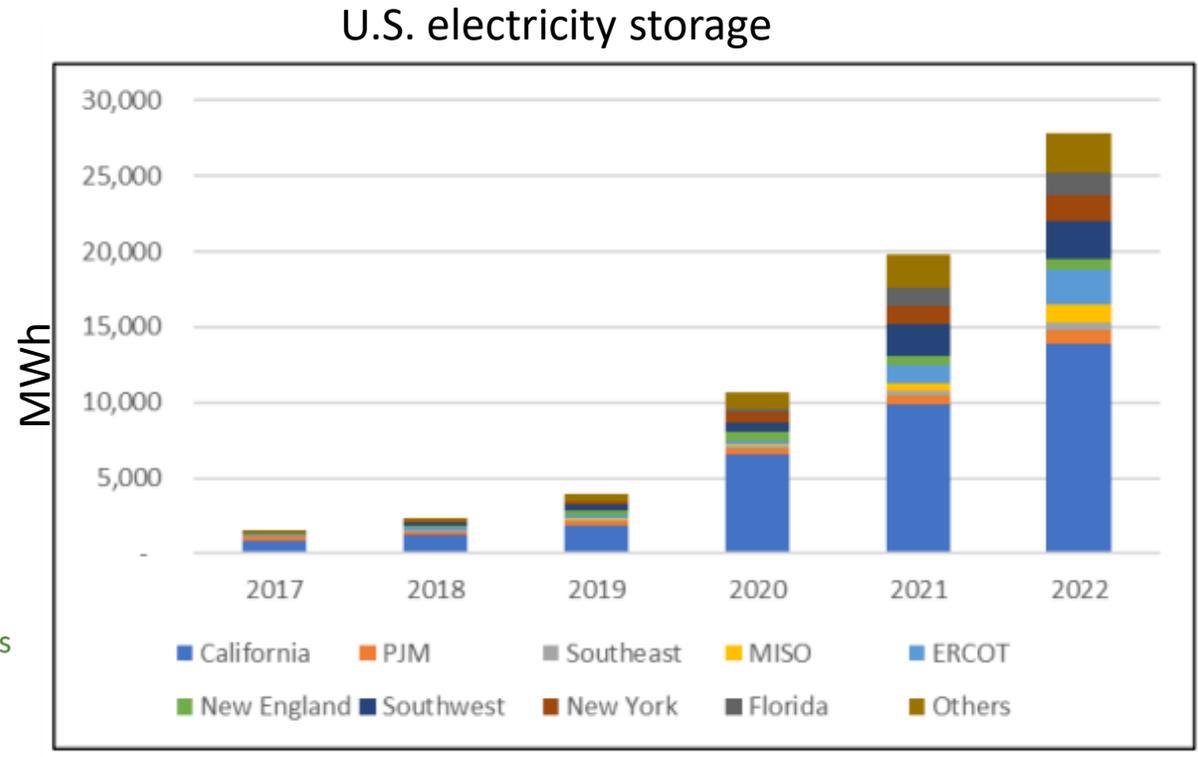
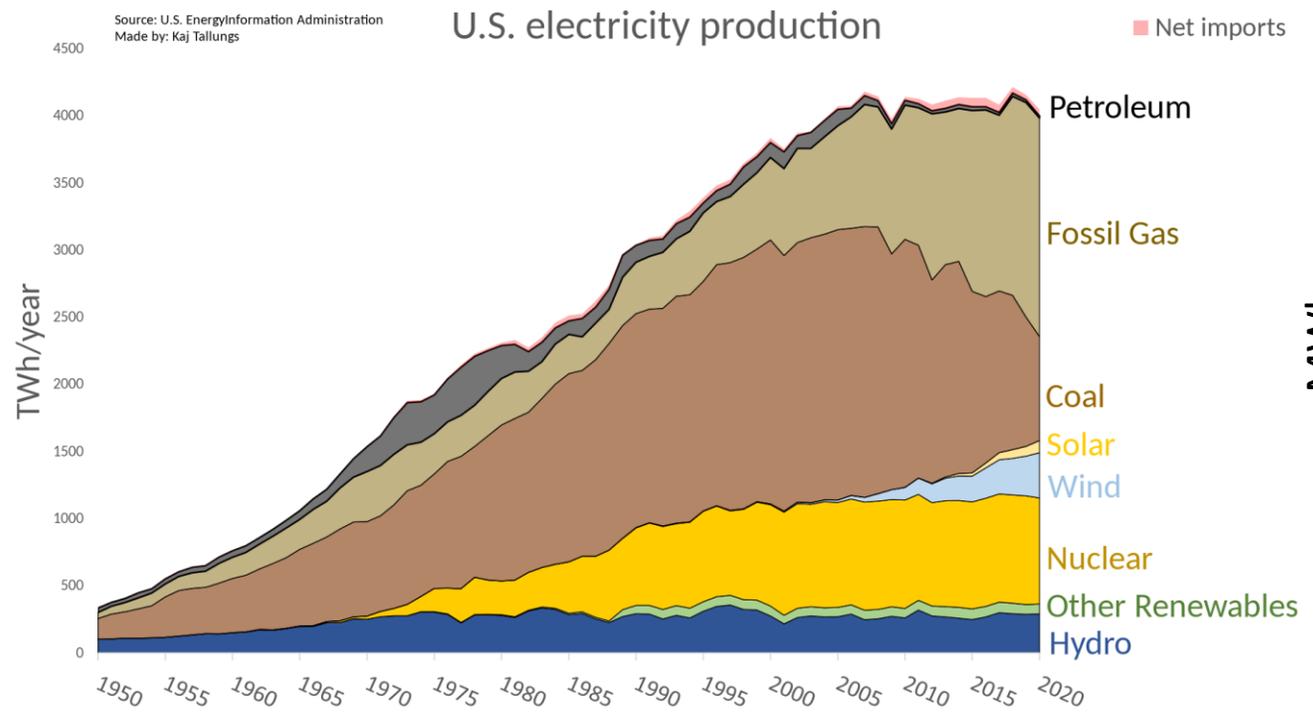
Clean Energy Group (CEG) is a national nonprofit working at the forefront of clean energy innovation to enable a just energy transition. The Clean Energy States Alliance (CESA) is a national, member-supported nonprofit for state energy organizations working together to advance the rapid expansion of clean energy technologies.



# Background: We are good at storing everything.. except electricity!



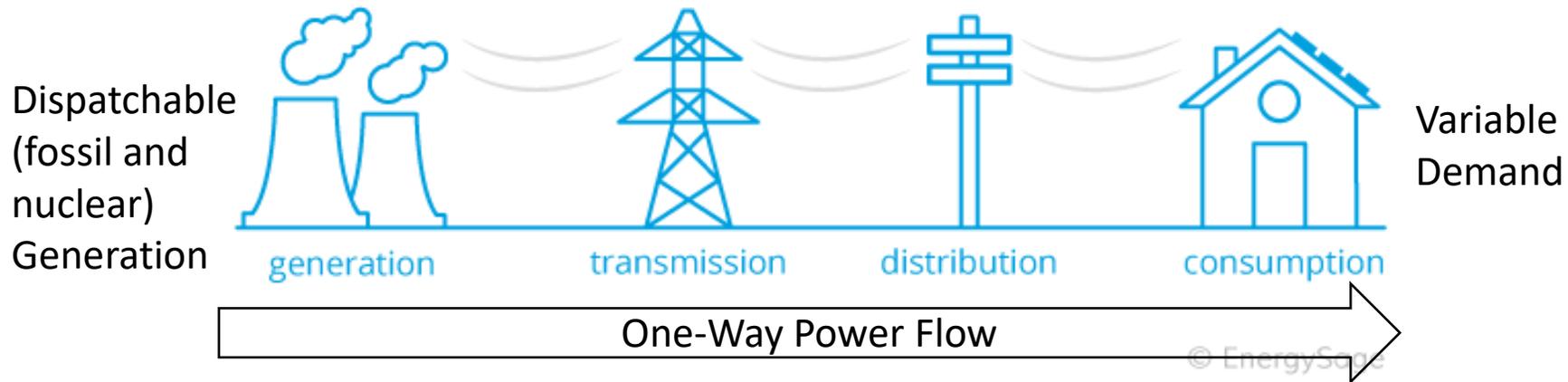
# US electric generation vs energy storage capacity



1 Terawatt = 1 million Megawatts

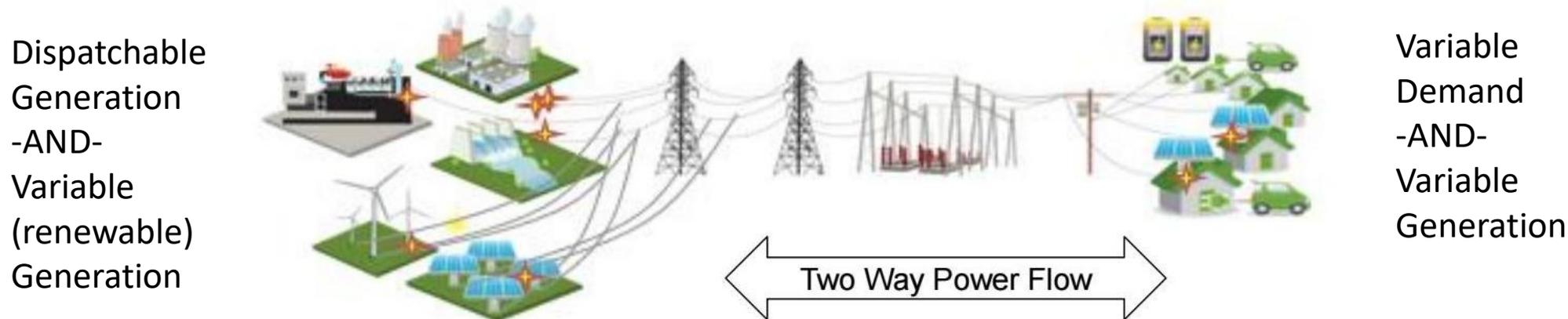
# The Modern Grid Needs Energy Storage!

Old Power Grid (world's biggest just-in-time delivery system)



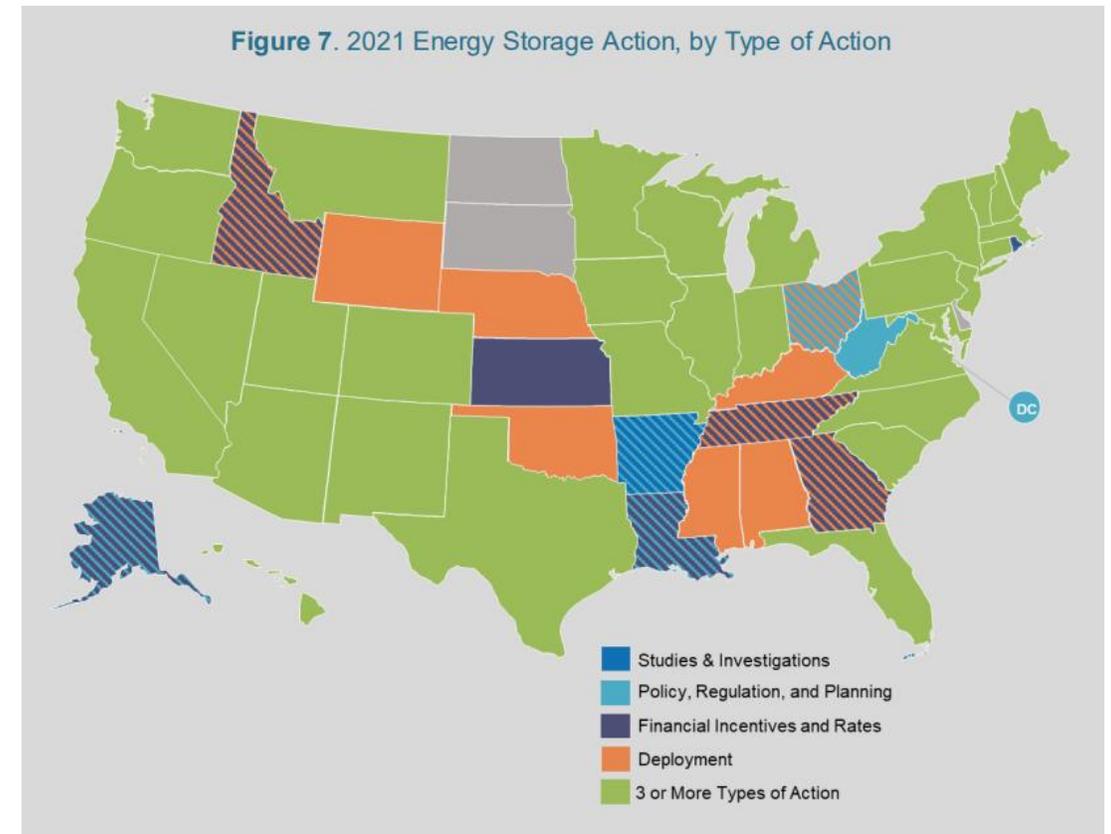
- One-way power flow
- Generation must equal consumption in real time
- Overbuilt to accommodate peak demand
- Cannot handle too much variable (renewable) generation
- Vulnerable to outages

Modern Power Grid (decentralized, flexible, resilient, highly variable)



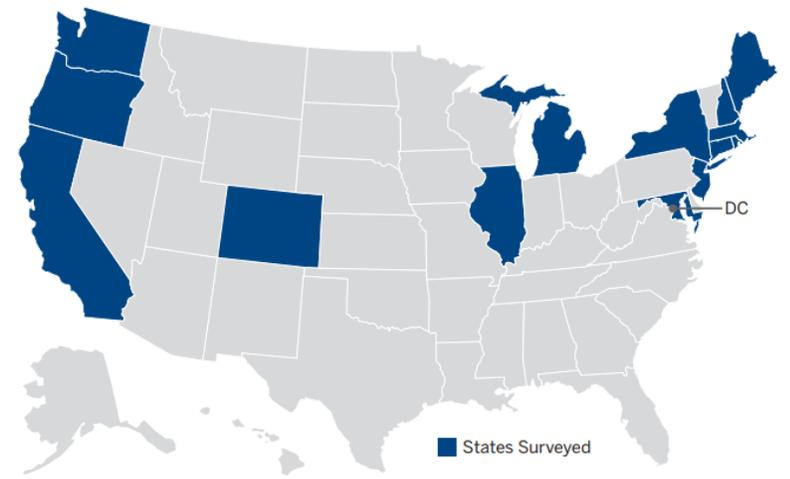
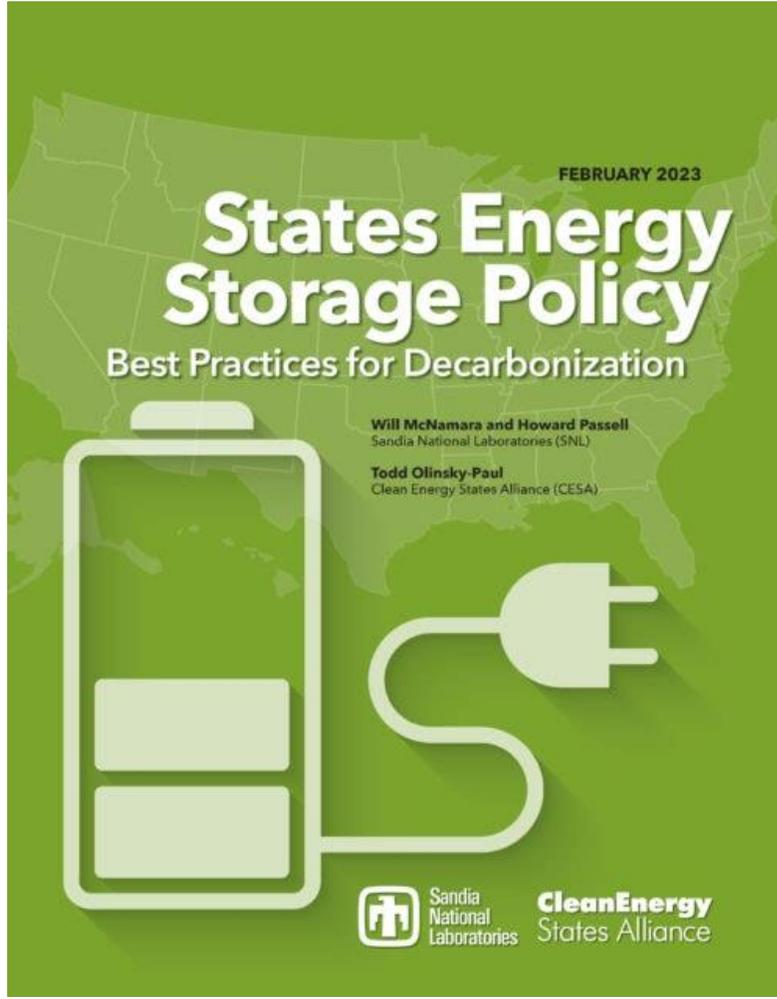
# State policy tools

1. Studies and planning
2. Grants (demonstration projects and pilots)
3. Longer-term policy and programs
  - a. Utility mandates/procurement targets
    - i. Storage procurement targets
    - ii. Storage in renewable/clean energy portfolio standards
    - iii. Clean peak standards
  - b. Rebates
  - c. Storage adders in renewables incentive programs
  - d. Storage incentives in energy efficiency programs
  - e. Tax incentives
  - f. Financing/clean energy financial institutions
  - g. Market and regulatory reform
  - h. Removal of barriers/reduction of soft costs
  - i. Technical assistance and resources



# New Report with Sandia National Laboratories

The report is based on our 2022 survey of leading decarbonization states. The report provides insights into key state energy storage policy priorities and challenges being encountered by these states.



### Surveyed States:

- California
- Colorado
- Connecticut
- District of Columbia
- Illinois
- Maine
- Massachusetts
- Maryland
- Michigan
- New Jersey
- New Hampshire
- New York
- Oregon
- Rhode Island
- Washington

# Top Five Policy Types Used by Leading Decarbonization States

1. Energy storage procurement mandates, targets or goals
2. Utility ownership of energy storage
3. Energy storage incentives (rebates, credits)
4. State-sanctioned energy storage benefit-cost analysis
5. Distribution system modeling

# Industry Survey

In addition to the state survey, we also surveyed six energy storage development companies and one industry consultant, to compare their policy priorities with those of the states.

- Enel North America
- Key Capture Energy
- New Leaf Energy (formerly Borrego)
- Nostromo Energy
- Sunrun
- Tesla
- An independent consultant to the energy storage industry

We wanted to find out whether the storage policies most frequently adopted by states were the policies most valued by non-utility energy storage developers.

# Industry Survey Results: Positive

- Industry respondents *unanimously agreed* that state energy storage policies, programs, and regulations are essential to their business
- They affirmed that their companies invest most of their efforts toward building market share in those states that adopt the most favorable energy storage policies
  - **Supportive state policy is essential to build markets!**
- Industry respondents were *nearly unanimous* (6 out of 7) in viewing states with decarbonization goals or policies as generally more welcoming than states without
  - **Related policies and targets, such as decarbonization, are also very important!**
- Industry respondents *unanimously cited* incentives/credits as being the single *most* helpful type of state energy storage policy
  - **While markets remain immature, direct incentives are most effective to bridge the energy storage economics gap**

**Recommendation: Set supportive clean energy targets and use direct incentives, such as rebates, performance payments and tax credits, as gap funding until markets mature.**

# Industry Survey Results: Negative

- Industry respondents were *nearly unanimous* (6 out of 7) in citing utility ownership of energy storage as the *least* helpful policy
  - **Storage developers may view storage-owning utilities as unfair competition**
- Distribution system modeling and changes to solar net metering regulations were also cited by several respondents as being among the *least* helpful state policies

	Helpful / Valuable?			
	Storage procurement targets	Storage incentives / credits	Utility ownership of energy storage	Distribution system modeling
State policymakers	✓	✓	✓	✓
Energy storage developers	✓	✓	✗	✗

**Recommendation:** State policymakers and regulators should take a hard look at the points of friction between electric utilities and third-party energy storage developers, such as utility ownership of storage, distribution system modeling, and interconnection standards.

# Top Five Policy Types Used by Leading Decarbonization States

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# Utility mandates / Procurement targets

## State Storage Targets

- **CA:** 1,825 MW by 2020
- **CT:** 1,000 MW by 2030
- **MA:** 1,000 MWh by 2025
- **ME:** 400 MW by 2030
- **NJ:** 2,000 MW by 2030
- **NV:** 1,000 MW by 2030
- **NY:** 6,000 MW by 2030
- **OR:** 5 MWh by 2020
- **VA:** 3,100 MW by 2035

## Example: California procurement targets (2013)

Proposed Energy Storage Procurement Targets (in MW)<sup>22</sup>

Storage Grid Domain Point of Interconnection	2014	2016	2018	2020	Total
<b>Southern California Edison</b>					
Transmission	50	65	85	110	310
Distribution	30	40	50	65	185
Customer	10	15	25	35	85
<b>Subtotal SCE</b>	<b>90</b>	<b>120</b>	<b>160</b>	<b>210</b>	<b>580</b>
<b>Pacific Gas and Electric</b>					
Transmission	50	65	85	110	310
Distribution	30	40	50	65	185
Customer	10	15	25	35	85
<b>Subtotal PG&amp;E</b>	<b>90</b>	<b>120</b>	<b>160</b>	<b>210</b>	<b>580</b>
<b>San Diego Gas &amp; Electric</b>					
Transmission	10	15	22	33	80
Distribution	7	10	15	23	55
Customer	3	5	8	14	30
<b>Subtotal SDG&amp;E</b>	<b>20</b>	<b>30</b>	<b>45</b>	<b>70</b>	<b>165</b>
<b>Total - all 3 utilities</b>	<b>200</b>	<b>270</b>	<b>365</b>	<b>490</b>	<b>1,325</b>

- Utilities may own up to 50% of required storage capacity
- CPUC prioritizes “public sector and low-income customers”

# Incentives

## State Rebate

### Programs:

**CA** – Self Generation Incentive Program (SGIP)  
(re-funded in 2018 at \$830 million through 2025)

**NY** – Market Acceleration Bridge Incentive Program  
(\$350 million)

### California SGIP

**Summary:** Ratepayer funded. Originally conceived in 2001 as a peak load reduction program supporting mainly solar PV; modified in 2011 to focus on greenhouse gas emissions reductions; modified again in 2016 to focus 79% of the program budget on energy storage. Incentives later modified to support state emissions reduction targets.

**Program design:** Up-front rebate in a declining block structure, with a 25% equity carve-out, defined geographically by environmentally disadvantaged and low-income communities, and affordable housing. 15% of SGIP budget reserved for residential customers. Equity and resilience budgets target wildfire areas.

**Program statistics:** Since 2016, SGIP has:

- Disbursed more than \$158 million in incentive payments
- Supported more than 828 behind-the-meter battery projects (residential and nonresidential) representing almost 67 MW (defined as average discharge power across two hours). Another \$31 million is reserved or pending.

# Options: Storage added to existing renewables incentive programs

Examples: Massachusetts, New York, Nevada

## Solar Massachusetts Renewable Target (SMART)

**Summary:** SMART replaced the previous SREC program in 2018. SMART is a declining block tariff program that provides fixed base compensation over a 10- or 20-year term. Offers solar rebates with stackable adders including a storage adder for new batteries connected with new solar PV behind customer meters.

Stackable adders:

- Building Mounted Solar
- Floating Solar
- Solar on a Brownfield
- Solar on an Eligible Landfill
- Canopy Solar
- Agricultural Solar
- Community Shared Solar
- Low Income Property Solar
- Low Income Community Shared Solar
- Public Entity Solar
- **Energy Storage**
- Solar Tracking

# Options: Storage as energy efficiency and demand response

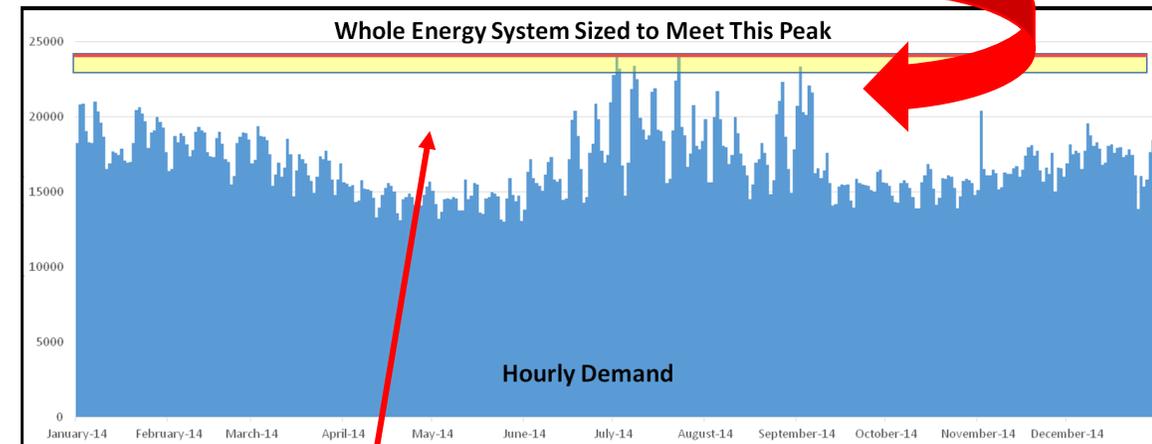
## Examples: Massachusetts, Rhode Island, Connecticut

Massachusetts ConnectedSolutions program:

- Storage incorporated into the state's energy efficiency program as a peak reduction measure
- Customers enter into multi-year contract with utility for BTM storage dispatch at peak demand hours
- Utility compensates customers for storage services
- Lower peak demand saves money for ratepayers
- Developers can finance pipelines of storage projects contracted into ConnectedSolutions, creating virtual power plants

The monetizable value of storage is partly due to the high costs of our oversized grid

The highest value of storage is in providing *capacity* to meet demand peaks... *not* in providing bulk energy.



White space = inefficiency in the system

# New England is a Leader in energy storage policy; Vermont is not.

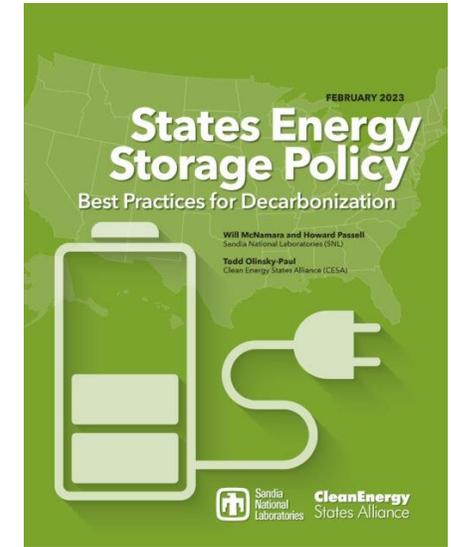
- New England, New York and California are leading the nation
- VT is falling behind the rest of New England
  - GMP is doing great work but the state is not doing much – we've left energy storage to the utilities
  - Other New England states have state targets, policy and programs
- Increasing storage *deployment* is not enough; we must direct storage *use* to support state policy goals
- Top recommendations
  - Energy storage procurement target/mandate
  - Energy storage rebate +/- performance incentive
- To create jobs and attract investment you have to make the Vermont market attractive



# Download the Reports

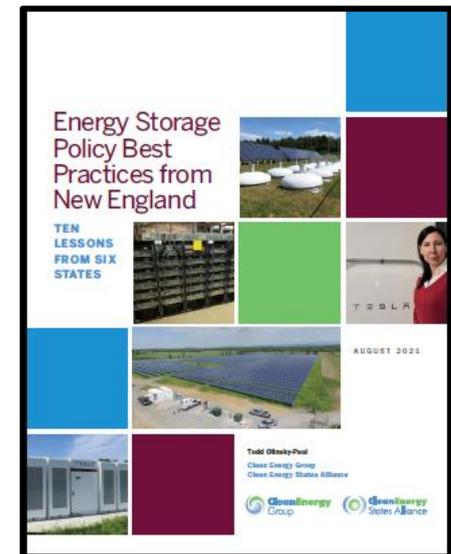
## ***States Energy Storage Policy: Best Practices for Decarbonization (2023)***

<https://www.cesa.org/resource-library/resource/states-energy-storage-policy-best-practices-for-decarbonization/>



## ***Energy Storage Policy Best Practices from New England: Ten Lessons from Six States (2021)***

<https://www.cesa.org/resource-library/resource/energy-storage-policy-best-practices-from-new-england/>



Thank You!

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